

What is DNL?

DNL stands for Day-Night Average Sound Level, and represents a 24-hour weighted annual average of noise events. So what?

This system was developed to accurately predict noise levels that would be interpreted as highly annoying to noise sensitive land uses and allow for consistent comparison. The DNL noise metric takes into consideration those times when noise events (such as an aircraft noise event is occurring) and the periods when no noise event is occurring. The noise levels during periods when noise events are not occurring is commonly referred to as the ambient (or background) noise level (for most suburban residential neighborhoods, this is about DNL 45 decibels). Another way to think of the DNL noise metric is that of a cumulative noise measurement. Each aircraft departure or arrival will add to the total noise exposure of the airport,

A unique aspect of the DNL metric is that it adds a penalty for events that occur between the hours of 10:00 p.m. and 7:00 a.m. This nighttime penalty takes into account the fact that most people are sleeping during this period. Each noise event that occurs during this time frame has an additional 10 decibels (dB) added to it. For example, if a Boeing 737-300 normally generates 85 dB at a certain point along its departure path, the DNL method would consider that to be 95 decibels at night. An increase in noise of 10 decibels is perceived by the human ear to be twice as loud, so this is a very significant aspect of the DNL metric.

The DNL metric is the FAA's only approved method of evaluating the impacts of aircraft noise. Any noise abatement or mitigation measure identified in a Federal Aviation Regulation Part 150 Noise Compatibility

Study must be based upon an analysis of the DNL contours. However, that does not preclude consideration of other noise metrics in these studies.

There has been a great debate about the relevance of the DNL metric for determining the impacts of noise on communities. Many believe that it is the noise from single aircraft over flights that should determine what is incompatible. The fact that people's reactions are based on individual noise events and not a 24-hour average is a supporting fact to this argument. Certain noise studies will evaluate a concept called Sound Exposure Level (SEL - sometimes incorrectly referred to as single event level). This method takes the total sound energy produced during each noise event at a specific location and normalizes it to a 1 second duration. Then different noise events can be compared to each other.

The hesitation of the FAA to consider SEL for noise impact evaluation is based on the complexities of applying it as a standard nationwide. How could you establish consistent compatible land use criteria at John F. Kennedy International and Syracuse Hancock International airports when the types of aircraft and numbers of departures and arrivals are so different? Each airport noise study would need to establish specific evaluation criteria for that area, and it would raise the complexity (and cost) of noise evaluation significantly.

The DNL noise metric may not be the perfect method of evaluating noise impacts, but it is the fairest method currently available, and the only metric that FAA will consider for funding abatement and mitigation programs.